REMARKS

I. Status Summary

Claims 7-140 are pending in the present application. Claims 19, 25-45, 56, 63-79, and 91-140 were previously withdrawn. Claims 7, 46, 55, 57, and 88-90 have been amended. Claims 54 and 62 have been canceled. New claims 141-145 have been added. No new matter has been introduced by the present amendment. Reconsideration of the application as amended and based on the arguments set forth hereinbelow is respectfully requested.

New claims 141-143 have been added. Support for the features recited by claims 141-143 can be found throughout the present application, particularly at Figure 2B.

New claim 144 has been added. Support for the features recited by claim 144 can be found throughout the present application, particularly at page 32, lines 6-12.

New claim 145 includes the features of claim 46 and canceled claim 62.

II. Claim Objections

The Examiner objected to claims 54, 57, and 88-90 for informalities. In particular, the Examiner stated that claim 54 includes the language "comprising a movable component attached to" when "a movable component" was introduced in claim 46, from which claim 54 depends. (Official Action, page 2). Claim 54 has been canceled. Therefore, the object to claim 54 is moot.

Regarding claim 57, the Examiner stated that the claim includes the language "comprising a substrate attached to" when "a substrate" was introduced in claim 46,

from which claim 57 depends. (Official Action, pages 2 and 3). Claim 57 has been amended to recite "the substrate" in order to provide proper antecedent basis.

Regarding claims 88-90, the Examiner stated that the claims include the language "the at least one movable actuation electrode" and "the movable at least one capacitive electrode," for neither of which antecedent basis is provided in claims 88-90 or their base claims. (Official Action, page 3). Claims 88 and 89 have been amended to recite "first actuation electrode" and "first capacitive electrode" rather than "the at least one movable actuation electrode" and "the movable at least one capacitive electrode". Applicants respectfully submit that proper antecedent basis is provides for "first actuation electrode" and "first capacitive electrode". Further, applicants respectfully submit that the amendments to claim 88 correct the lack of antecedent basis in claim 90.

For the reasons set forth above, applicants respectfully submit that the objections to claims 54, 57, and 88-90 should be withdrawn.

III. Claim Rejections Under 35 U.S.C. § 102

Claims 7-17, 20, 21, 46-55, 57, 58, and 80-90 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2004/0036132 to de los Santos (hereinafter, "de los Santos"). Further, claims 7, 8, 15, 18, 20, 22-24, 46, 57, and 59-61 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,377,438 to Deane et al. (hereinafter, "Deane"). These rejections are respectfully traversed.

III.A. Claim Rejections Based Upon de los Santos

Claim 7 recites a micro-electro-mechanical system (MEMS) variable capacitor including first and second actuation electrodes being spaced apart. For example, referring to Figure 2A of the present application, a variable capacitor **100** includes a stationary actuation electrode **SAE** and a movable actuation electrode **MAE** that are spaced apart. Claim 7 also recites that at least one of the actuation electrodes are movable with respect to the other actuation electrode when a voltage is applied across the first and second actuation electrodes. Referring again to Figure 2A, when voltage supply **VS** applies a voltage across electrodes **SAE** and **MAE**, electrode **MAE** moves towards electrode **SAE**. (Application, page 24, lines 7). Further, claim 7 recites that a first capacitive electrode is attached to and electrically isolated from the first actuation electrode. Claim 7 also recites that a second capacitive electrode is attached to and electrically isolated from the second actuation electrode and spaced from the first capacitive electrode.

Further, claim 7 has been amended to recite movement of at least one of the capacitive electrodes in a substantially straight direction with respect to a normal of a surface of the other capacitive electrode upon application of the voltage across the first and second actuation electrodes to change the capacitance between the first and second capacitive electrodes. Referring again to Figure 2A, direction arrow **110** indicates that movable actuation electrode **MAE** moves towards stationary actuation electrode **SAE**.

Regarding claim 7, the Examiner stated that de los Santos discloses a MEMS variable capacitor as recited by the claim. (Official Action, page 4). In particular, the

Examiner stated that a movable electrode **116** and a stationary electrode **112** shown in Figures 1-4 of de los Santos correspond to the first and second actuation electrodes recited by claim 7. (Official Action, page 4). The Examiner also stated that a movable conductive plate **118** and a stationary conductive plate **114** shown in Figures 1-4 of de los Santos correspond to the first and second capacitive electrodes recited by claim 7. (Official Action, page 4).

Referring to Figure 1 of de los Santos, variable capacitor **100** is shown in a position where voltage is not applied across electrodes **112** and **116**. When voltage is applied across electrodes **112** and **116**, electrode **116** moves towards electrode **112** and, as a result, causes a movable component **106** to rotate into a position shown in Figure 2. Conductive plate **118** is attached to movable component **106** and therefore moves in a rotational direction with respect to conductive plate **114** when component **106** moves. Pivot posts **104** support component **106** for rotational movement of the opposing ends of component **106** about a pivot point **108**. (de los Santos, paragraph 36). Therefore, conductive plate **118** moves in a rotational direction with respect to conductive plate **114** when voltage is applied to electrodes **112** and **116**. In marked contrast, claim 7 recites that at least one of the capacitive electrodes moves in a substantially straight direction with respect to a normal of a surface of the other capacitive electrode. de los Santos does not teach movement of a capacitive electrode in a substantially straight direction with respect to a normal of a surface of another capacitive electrode. Therefore, de los Santos fails to teach each and every feature required by claim 7.

Claims 8-17, 20, and 21 depend from claim 7. Therefore, the comments presented above relating to claim 7 apply equally to claims 8-17, 20, and 21.

For the reasons set forth above, applicants respectfully submit that de los Santos does not teach each and every feature of the present subject matter, and therefore that claims 7-17, 20, and 21 are not anticipated by de los Santos. Applicants respectfully request that the rejection of claims 7-17, 20, and 21 under 35 U.S.C. § 102 be withdrawn and the claims allowed at this time.

Claim 46 recites a variable capacitor comprising a movable component being movable with respect to a substrate surface. Further, claim 46 recites that the movable component includes first and second portions, wherein the first portion is positioned further from the substrate surface than the second portion. For example, referring to Figure 2A of the present application, a movable component **MC** is provided that has two portions, where one of the portions is positioned closer to a surface of substrate **102** than the other portion. Claim 46 also recites first and second actuation electrodes that are spaced apart. The first actuation electrode is attached to the first portion of the movable component. For example, referring to Figure 2A, actuation electrodes **MAE** and **SAE** are spaced apart. Further, movable actuation electrode **MAE** is attached to movable component **MC**. The second actuation electrode is attached to the substrate. For example, referring to Figure 2A, stationary actuation electrode **SAE** is attached to substrate **100**. Further, claim 46 has been amended to recite that the first actuation electrode is movable in a substantially straight direction with respect to a normal of a surface of the second actuation electrode when a voltage is applied across the first and second actuation electrodes. Claim 46 also recites a

first capacitive electrode attached to the second actuation electrode. Further, claim 46 recites a second capacitive electrode attached to the second portion of the movable component and spaced from the first capacitive electrode for movement of the first capacitive electrode with respect to the second capacitive electrode upon application of voltage across the first and second actuation electrodes to change the capacitance between the first and second capacitive electrodes. Summarily, de los Santos fails to teach each and every feature recited by claim 46.

Regarding claim 46, the Examiner stated that de los Santos discloses a MEMS variable capacitor as recited by the claim. (Official Action, page 6). In particular, the Examiner stated that Figures 1-4 of de los Santos discloses a movable component **104-106** being movable with respect to a substrate **102**. (Official Action, page 6). Further, the Examiner stated that components **106** and **104** correspond to the first and second portions, respectively, of the movable component recited by claim 46. (Official Action, page 6). The Examiner also stated that a substrate **102** shown in Figures 1-4 of de los Santos corresponds to the substrate recited by claim 46. As stated above, claim 46 recites that the movable component is movable with respect to a substrate and includes first and second portions. Thus, the first and second portions recited by claim 46 are movable with respect to the substrate. Components **104** of de los Santos are pivot posts. Pivot posts **104** do not move with respect to substrate **102**. Therefore, pivot posts **104** cannot be considered a portion of a movable component that moves with respect to a substrate as required by claim 46.

Further, claim 46 recites that the first actuation electrode is movable with respect to a second actuation electrode when a voltage is applied across the

electrodes. If an actuation electrode is attached to pivot post **104** as described by the Examiner, the actuation electrodes would not be able to move with respect to one another because pivot post **104** cannot move with respect to substrate **102**, which is fixed to stationary electrode **112**. Therefore, if the components were configured as described by the Examiner, the actuation electrodes would not be movable with respect to one another on application of voltage.

Further, as stated above, claim 46 has been amended to recite that the first actuation electrode is movable in a substantially straight direction with respect to a normal of a surface of the second actuation electrode when a voltage is applied across the first and second actuation electrodes. As stated above, de los Santos fails to teach movement of an electrode in a substantially straight direction with respect to a normal of a surface of another electrode. Thus, de los Santos fails to teach the claim 46 features of movement of an electrode in a substantially straight direction with respect to a normal of a surface of another electrode.

Claims 47-55, 57, and 58 depend from claim 46. Therefore, the comments presented above relating to claim 46 apply equally to claims 47-55, 57, and 58.

For the reasons set forth above, applicants respectfully submit that de los Santos does not teach each and every feature of the present subject matter, and therefore that claims 46-55, 57, and 58 are not anticipated by de los Santos. Applicants respectfully request that the rejection of claims 46-55, 57, and 58 under 35 U.S.C. § 102 be withdrawn and the claims allowed at this time.

Claim 80 recites a variable capacitor comprising first and second actuation electrodes being spaced apart. Further, claim 80 recites that the first actuation

electrode is movable with respect to the second actuation electrode when a voltage is applied across the first and second actuation electrodes. Claim 80 also recites a first capacitive electrode attached to the first actuation electrode. Further, claim 80 recites a second capacitive electrode attached to the second actuation electrode. The second capacitive electrode is spaced from the first capacitive electrode for movement of the first capacitive electrode with respect to the second capacitive electrode upon application of voltage across the first and second actuation electrodes to change the capacitance between the first and second capacitive electrodes. The capacitive electrodes are spaced closer to one another than the actuation electrodes. Referring to Figure 2A, for example, capacitive electrodes **MCE** and **SCE** are spaced closer together than actuation electrodes **MAE** and **SAE**. Summarily, de los Santos fails to teach each and every feature recited by claim 80.

Regarding claim 80, the Examiner stated that de los Santos discloses a MEMS variable capacitor as recited by the claim. (Official Action, page 8). In particular, the Examiner stated that movable electrode **116** and stationary electrode **112** shown in Figures 1-4 of de los Santos correspond to first and second actuation electrodes, respectively, recited by claim 80. (Official Action, page 8). The Examiner also stated that movable conductive plate **118** and stationary conductive plate **114** shown in Figures 1-4 of de los Santos correspond to the first and second capacitive electrodes, respectively, recited by claim 80. Further, the Examiner stated that de los Santos discloses that the capacitive electrodes are spaced closer to one another than the actuation electrodes. (Official Action, page 8). Applicants respectfully submit that de los Santos fails to show or describe conductive plates **114** and **118** being spaced

closer than electrodes **112** and **116**. For example, referring to Figures 1 and 3 of de los Santos, conductive plates **114** and **118** are spaced from one another at about the same distance that electrodes **112** and **116** are spaced from one another. Further, as shown in Figure 2, when a voltage is applied across electrodes **112** and **116**, the spacing of conductive plates **114** and **118** from one another is greater than the spacing of electrodes **112** and **116** from one another. Therefore, de los Santos fails to disclose capacitive electrodes being spaced closer to one another than the actuation electrodes.

Claims 81-90 depend from claim 80. Therefore, the comments presented above relating to claim 80 apply equally to claims 81-90.

For the reasons set forth above, applicants respectfully submit that de los Santos does not teach each and every feature of the present subject matter, and therefore that claims 80-90 are not anticipated by de los Santos. Applicants respectfully request that the rejection of claims 80-90 under 35 U.S.C. § 102 be withdrawn and the claims allowed at this time.

III.B. Claim Rejections Based Upon Deane

As stated above, claim 7 recites a micro-electro-mechanical system (MEMS) variable capacitor including first and second actuation electrodes being spaced apart. For example, referring to Figure 2A of the present application, a variable capacitor **100** includes a stationary actuation electrode **SAE** and a movable actuation electrode **MAE** that are spaced apart. Claim 7 also recites that at least one of the actuation electrodes are movable with respect to the other actuation electrode when a voltage is

applied across the first and second actuation electrodes. Referring again to Figure 2A, when voltage supply **VS** applies a voltage across electrodes **SAE** and **MAE**, electrode **MAE** moves towards electrode **SAE**. (Application, page 24, lines 7). Further, claim 7 recites that a first capacitive electrode is attached to and electrically isolated from the first actuation electrode. Claim 7 also recites that a second capacitive electrode is attached to and electrically isolated from the second actuation electrode and spaced from the first capacitive electrode.

Further, claim 7 has been amended to recite movement of at least one of the capacitive electrodes in a substantially straight direction with respect to a normal of a surface of the other capacitive electrode upon application of the voltage across the first and second actuation electrodes to change the capacitance between the first and second capacitive electrodes. Referring again to Figure 2A, direction arrow **110** indicates that movable actuation electrode **MAE** moves towards stationary actuation electrode **SAE**.

Regarding claim 7, the Examiner stated that Deane discloses a MEMS variable capacitor as recited by the claim. (Official Action, page 9). In particular, the Examiner stated that an electrode element **114** and a substrate electrode **104** shown in Figure 4B of Deane correspond to first and second actuation electrodes, respectively, recited by claim 80. (Official Action page 9). The Examiner also stated that capacitor plates **16** and **12** shown in Figure 1 of Deane correspond to the first and second capacitive electrodes, respectively, recited by claim 80. (Official Action, page 10).

Referring to Figure 1 of Deane, capacitor plate **16** is fixed to a flexible membrane **20**. One end of flexible membrane **20** is secured to a substrate **14** via a

fixed pivot structure **22**, such that an unattached portion of membrane **20** extends in a cantilevered manner overlying capacitor plate **12**. (Deane, column 4, lines 47-52). When actuated, flexible flap **26** moves to cause flexible membrane **20** to flex and rotate about pivot structure **22**. As a result, capacitor plate **16** rotates about pivot structure **22** due to its attachment to membrane **20**. Further, capacitor plate **16** moves in a rotational direction with respect to capacitor plate **12**. In marked contrast, claim 7 recites that at least one of the capacitive electrodes moves in a substantially straight direction with respect to a normal of a surface of the other capacitive electrode. Deane does not teach movement of a capacitive electrode in a substantially straight direction with respect to a normal of a surface of another capacitive electrode. Therefore, Deane fails to teach each and every feature required by claim 7.

Claims 8, 15, 18, 20, and 22-24 depend from claim 7. Therefore, the comments presented above relating to claim 7 apply equally to claims 8, 15, 18, 20, and 22-24.

For the reasons set forth above, applicants respectfully submit that Deane does not teach each and every feature of the present subject matter, and therefore that claims 7, 8, 15, 18, 20, and 22-24 are not anticipated by Deane. Applicants respectfully request that the rejection of claims 7, 8, 15, 18, 20, and 22-24 under 35 U.S.C. § 102 be withdrawn and the claims allowed at this time.

As stated above, Claim 46 recites a variable capacitor comprising a movable component being movable with respect to a substrate surface. Further, claim 46 recites that the movable component includes first and second portions, wherein the first portion is positioned further from the substrate surface than the second portion. Claim 46 also recites first and second actuation electrodes that are spaced apart. The

first actuation electrode is attached to the first portion of the movable component. The second actuation electrode is attached to the substrate. Further, claim 46 has been amended to recite that the first actuation electrode is movable in a substantially straight direction with respect to a normal of a surface of the second actuation electrode when a voltage is applied across the first and second actuation electrodes. Claim 46 also recites a first capacitive electrode attached to the second actuation electrode. Further, claim 46 recites a second capacitive electrode attached to the second portion of the movable component and spaced from the first capacitive electrode for movement of the first capacitive electrode with respect to the second capacitive electrode upon application of voltage across the first and second actuation electrodes to change the capacitance between the first and second capacitive electrodes. Summarily, Deane fails to teach each and every feature recited by claim 46.

Regarding claim 46, the Examiner stated that Deane discloses a MEMS variable capacitor as recited by the claim. (Official Action, pages 11 and 12). In particular, the Examiner stated that an electrode element **114** and a substrate electrode **104** shown in Figure 4B of Deane correspond to first and second actuation electrodes, respectively, recited by claim 80. (Official Action page 12). The Examiner also stated that capacitor plates **16** and **12** shown in Figure 1 of Deane correspond to the first and second capacitive electrodes, respectively, recited by claim 80. (Official Action, page 12).

Referring to Figure 4B of Deane, movable membrane **108** includes an end attached to a fixed portion. When voltage is applied to electrodes **104** and **114**,

membrane **108** curls about the fixed end of the membrane. As a result, electrode **114** curls away from electrode **104** in a rotational direction. In marked contrast, claim 46 requires that the first actuation electrode is movable in a substantially straight direction with respect to a normal of a surface of the second actuation electrode when a voltage is applied across the electrodes. Deane does not disclose this feature of claim 46. Thus, Deane fails to teach each and every feature required by claim 46.

Claims 57 and 59-61 depend from claim 46. Therefore, the comments presented above relating to claim 46 apply equally to claims 57 and 59-61.

For the reasons set forth above, applicants respectfully submit that Deane does not teach each and every feature of the present subject matter, and therefore that claims 46, 57, and 59-61 are not anticipated Deane. Applicants respectfully request that the rejection of claims 46, 57, and 59-61 under 35 U.S.C. § 102 be withdrawn and the claims allowed at this time.

IV. Allowable Subject Matter

The Examiner indicated that claim 62 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. (Official Action, page 13). Claim 62 depends upon claim 46. As stated above, new claim 144 has been added to include the features of claim 46 and dependent claim 62. Therefore, it is respectfully submitted that new claim 144 is in condition to be formally allowed.

Applicants note that the features recited by canceled claim 62, and now new claim 144, are shown in the Figures 26, 27A, and 27B embodiment rather than in the

Figures 1-3 embodiment. Claim 62 was erroneously grouped with the embodiment of Figures 1-3 in the Response to Restriction/Election Requirement dated April 21, 2005. If new claim 144 is to remain in the present application, Figures 26, 27A, and 27B should be considered applicable. Applicants submit that at least claim 7, if allowed, would likely be a generic claim for the embodiment of Figures 26, 27A, and 27B.

CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

DEPOSIT ACCOUNT

The Commissioner is hereby authorized to charge any fees associated with the filing of this correspondence to Deposit Account No. **50-0426**.

Respectfully submitted,

JENKINS, WILSON & TAYLOR, P.A.

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